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# STABILIZATION OF THE NITRITE CONTENT OF SEA WATER BY FREEZING

This note reports the third of a series of experiments designed to explore the effects of freezing on the stability of the chemical content of sea water. Stabilization by freezing is desirable since it eliminates the need of adding chemical preservatives with accompanying impurities to the sample. Collier and Marvin (1953) showed that the ratio of inorganic to organic phosphorus is stabilized by freezing. May (1960) demonstrated that freezing stabilizes the carbohydrate content of sea water for periods of up to 7 weeks. Similarly, it is shown that the $NO_2^-$–N content of sea water can also be stabilized.

The sea water used in this experiment

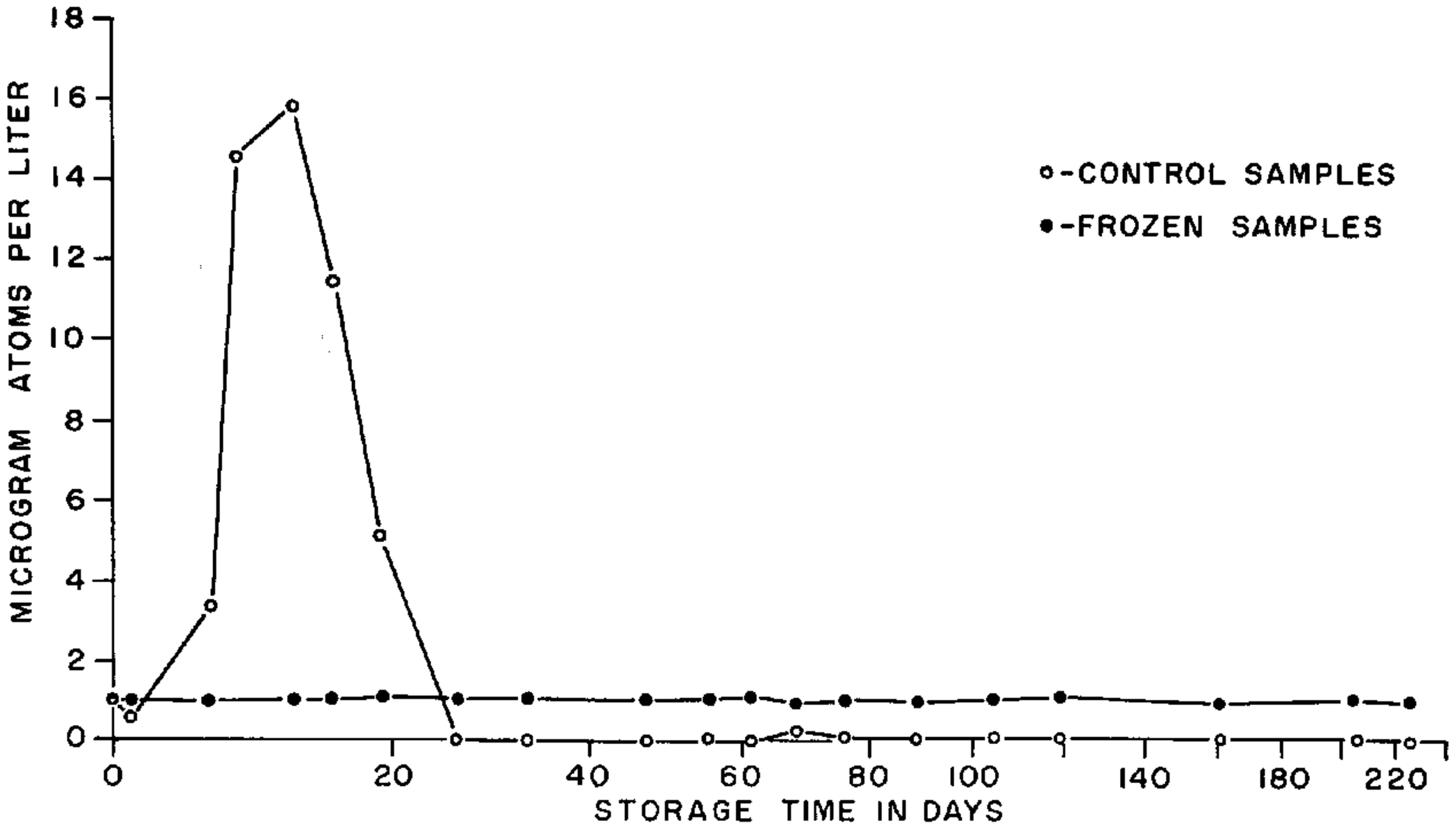


FIG. 1. Nitrite-nitrogen content of frozen and unfrozen seawater samples, plotted as a function of storage time.

was filtered and then fortified with $NaNO_2$ to give an initial nitrite concentration of about 1.0 $\mu$g at./L. Approximately half of the treated water was dispensed into 120, 25 × 200-mm pyrex culture tubes equipped with polyseal caps. These samples were immediately frozen and stored at –18°C. The remainder of the treated water, about 3 gal, was stored at room temperature in a 5-gal pyrex carboy.

The method described by Bendschneider and Robinson (1952) was used to determine the nitrite concentrations in all samples. For the initial determination, subsamples from 10 tubes were analyzed immediately after they had been filled. Each determination thereafter consisted of analyses of 10 aliquots drawn from the storage container held at room temperature, and duplicate analyses on each of 5 frozen samples. At the beginning of the experiment, samples were analyzed twice a week. As the experiment progressed, the time interval between determinations was increased as shown in Figure 1.

A comparison of the two curves in Figure 1 shows the variability of the nitrite concentration in unfrozen sea-water samples and demonstrates the effectiveness of freezing as a means of stabilization. A statistical check ("F" test) of the frozen-sample data indicated that observed fluctuations were well within the limits of the precision of the analytical method.

In view of these results, it is recommended that all sea-water samples on which nitrite analyses are to be performed at a later date, be frozen as soon after collection as possible.

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